

Application No 10/028,439
Amendment "B" dated August 6, 2004
Reply to Office Action mailed April 9, 2004

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) An integrated vertical cavity surface emitting laser and power monitor assembly, comprising:
 - a vertical cavity surface emitting laser for producing a light beam along a light path;
 - a semiconductive substrate having an etched cavity in said light path; and
 - a light sensor on said semiconductive substrate and positioned along said light path between said vertical cavity surface emitting laser and said etched cavity in said semiconductive substrate;
 - wherein said vertical cavity surface emitting laser is attached to said semiconductive substrate;
wherein said light sensor blocks only part of the light beam produced by said vertical cavity surface emitting laser during use such that light of the light beam not blocked by said light sensor is allowed to pass into said etched cavity.
2. (Previously Presented) An assembly according to claim 1, wherein said semiconductive substrate includes a thin membrane between said etched cavity and said vertical cavity surface emitting laser.
3. (Original) An assembly according to claim 2 wherein said light sensor is on said thin membrane.
4. (Original) An assembly according to claim 1, wherein said light sensor is a metalsemiconductor-metal light sensor.
5. (Previously Presented) An assembly according to claim 1, whcrein said semiconductive substrate includes an aperture in said light path, whcrein said aperture extends from said light sensor to said etched cavity.

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6. (Previously Presented) An assembly according to claim 1, further including a metal contact on said semiconductive substrate, wherein said vertical cavity surface emitting laser is attached to said semiconductive substrate via said metal contact.

7. (Original) An assembly according to claim 6, wherein said vertical cavity surface emitting laser receives electrical power via said metal contact.

8. (Currently Amended) An integrated vertical cavity surface emitting laser and power monitor assembly, comprising:

a vertical cavity surface emitting laser for producing a light beam along a light path;

a substrate having an etched cavity in said light path;

a light sensor on said substrate and along said light path;

an optical fiber in said etched cavity and aligned in said light path;

wherein said vertical cavity surface emitting laser is attached to said substrate;

wherein said light sensor is positioned along said light path between said vertical cavity surface emitting laser and said optical fiber.

9. (Original) An assembly according to claim 8, further comprising an optical element between said optical fiber and said vertical cavity surface emitting laser.

10. (Original) An assembly according to claim 9, wherein said optical element couples light from said vertical cavity surface emitting laser into said optical fiber.

11. (Original) An assembly according to claim 10, wherein said optical element is in said etched cavity, and wherein said optical element and said optical fiber are held in said etched cavity using an adhesive.

12. (Original) An assembly according to claim 11, wherein said adhesive includes epoxy.

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13. (Original) An assembly according to claim 8, further including a controller for controlling said light beam based on a signal from said light sensor.

14. (Currently Amended) A method of fabricating a semiconductor assembly, comprising:

etching a semi conductive substrate to form a cavity;

forming a photo detector on the semiconductive substrate; and

mounting a vertical cavity surface emitting laser on the semi conductive substrate such that light emitted from the vertical cavity surface emitting laser travels along a light path such that a portion of the light irradiates and is absorbed by the photodetector and a portion passes by the photodetector and into the cavity.

15. (Original) A method according to claim 14, wherein the cavity is formed by anisotropic etching.

16. (Previously Presented) A method according to claim 15, wherein the anisotropic etching results in a thin membrane between the cavity and a top of the silicon wafer semi conductive substrate, and wherein the photo detector is formed on the thin membrane.

17. (Original) A method according to claim 16, wherein at least part of the thin membrane is removed.

18. (Original) A method according to claim 14, further including:
forming a metal contact on the semiconductive substrate; and
attaching the vertical cavity surface emitting laser to the metal contact.

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19. (Original) A method according to claim 14, further including;
disposing an optical element in the etched cavity;
locating an end of an optical fiber in the etched cavity such that the end of the optical fiber is optically aligned with the disposed optical element; and
scaling the disposed optical element and the end of the optical fiber in the etched cavity.
20. (Original) A method according to claim 14, further including making electrical connections between a controller and the photo detector and the vertical cavity surface emitting laser.
21. (Previously Presented) A assembly according to claim 1, wherin the semiconductive substrate includes a silicon substrate.
22. (Original) A assembly according to claim 8, wherein the substrate includes a silicon substrate.
23. (Previously Presented) A method according to claim 14, wherin the semiconductive substrate includes a silicon substrate.

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24. (New) An integrated vertical cavity surface emitting laser and power monitor assembly, comprising:

a vertical cavity surface emitting laser for producing a light beam along a light path;

a semiconductive substrate having an etched cavity in said light path and including a thin membrane between said etched cavity and said vertical cavity surface emitting laser; and

a light sensor on said semiconductive substrate and positioned on said thin membrane of said substrate along said light path;

wherein said vertical cavity surface emitting laser is attached to said semiconductive substrate;

wherein said light sensor blocks only part of the light beam produced by said vertical cavity surface emitting laser during use such that light of the light beam not blocked by said light sensor is allowed to pass into said etched cavity.

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AMENDMENTS TO THE DRAWINGS

The attached sheet of drawings includes changes to Figure 3. This sheet, which includes Figure 3, replaces the original sheet including Figure 3.

Attachment: Replacement Sheet

Annotated Sheet Showing Changes